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Significant progress has been achieved on key research projects that were supported by this grant contract. We have extended the asymptotic modelling of free surface jets, through an averaging approach, to all orders in perturbation [1]. These higher order theories were then extended to pointwise approximations, which yield more detailed characteristics of the flow [2]. Dynamical ill-posedness of these model equations was discussed in [3]. Fully time-dependent model simulations were developed in [4]. Practical applications of these models were given in [5] for fiber spinning processes. Through interactions with government [6] and private industry [7] we have transferred this basic research to important applied problems.

REFERENCES

1. Bechtel, S.E., Forest, M.G., Lin, K., Journal of Stability and Applied Analysis of Continua, accepted, in press.
2. Bechtel, S.E., Forest, M.G., Cao, J., Bolinger, K., to be submitted to SIAM J. Appl. Math.
3. Forest, M.G., Wang, Q., Theoretical and Computational Fluid Dynamics, Volume 2, 1-25 (1990).
4. Forest, M.G., Wang, Q., submitted to SIAM J. Appl. Math.
5. Bechtel, S.E., Cao, J., Forest, M.G., Journal of Rheology, accepted, to appear.
6. Bechtel, S.E., Cooper, J., Forest, M.G., Venkataraman, V., Petersson, N.A., Reichard, D., Saleh, A., I and II, in preparation, to be submitted to Journal of Fluid Mechanics.
7. Bechtel, S.E., Forest, M.G., Wang, W., Symposium on Recent Advances in non-Newtonian Fluid Flows, 1992 Winter Annual ASME Meeting, accepted.

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